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Wind power - conference call

3/5/09

Warren:

20 yrs in Europe → wind turbine noise has been very researched. {Denmark}
over the years. {Belgium} {Germany}

Regulations ^{adopted} ~~across~~ by each particular country. In US → slow response to wind turbine noise. ~~Industrial noise~~ Industrial noise started being addressed in 60's-70's, but we haven't addressed wind turbine noise yet.

Internet -

wind turbine experts, studies in Europe, conclusions drawn. - people have access to this info.

Dr. Pierpont → studies in US recently done.
medical research conducted. (scientific study).

Science behind wind turbine noise →
low-freq. energy causes a rumbling.

At unknown distance → oft same of that ~~noise~~
rumbling noise, especially w/ windows open
at night in rural areas.

EXHIBIT

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* Low-freq. rumble created by turbines.

France:

(L_{-90}) Least 10% of sound that occurs at night \rightarrow

(L_{-90+2}) Acoustic sand at night can be

twice what it is, based on A-weighted sand
(France said no to turbines! (Measured at property line))

Acoustic energy can damage hearing!

USA Mills:

* Just because you can hear it doesn't mean it has adverse health effects!

Women:

A-weighted measurements established by OSHA for indust. noise \rightarrow Different altogether than wind turbines.

A-weighted is based around hearing protection!

$L_{-90} \rightarrow$ allow this to be adjustable to existing sand level of the area (raise base-line up!)

European Standards:

UK = 43 dBa or $L_{-90} + 5$

Australia = 35 dBa

* Captus lower freq. noise the same as US does.

* Movie rules are very conservative in US.
or 45 dBa in ME!

(\hookrightarrow But, as a community we have not taken account for the low-freq. spectrum!)

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The other countries use dBa as well, not dBC.

→ But, ME needs to think about law freq.

Dora Mills:

- ① Went thru Dr. Pierpoint's studies. She says it's not scientific (group of interested ≠ scientific study!)
- ② CO - DOE studies → noise not related to medical issues.
- ③ Consider → a couple articles in journals
can have annoyance, but not necessarily health effects.
- ④ Europe - annoyance = adverse health effect (WHO)
- World Health Organization -
- studies done in urban areas, not rural!
- ⑤ UMass ~~Boston~~ - 1995
- info from around N.E.
- info in Netherlands = 30-35 dBa.
- ⑥ ME - looked at Std's.
→ Reviewed people issues in Mansfield.
★ → Are car reg. protective enough?

Not a lot of evidence of adverse health effects, even at Mans Hill, but subjective!

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Anecdotal issues w/ noise only!

Mars Hill ^{ref.} ~~issues~~ ^{Wants DCP} Mars hill a 5 decided variance (for 50%) but we won't do that again..

Warren: 45 dBA will still penetrate their houses!
(low-freq noise) → noise can get inside and resonate. → consequently, noise can be louder inside than outside!

- Can't regulate indoor noise!

Annoyance based on L10 → Warren says not credible!

? ME's noise levels based on:

↳ 10% of pop. will be annoyed by noise.

Warren → Has issue w/

Model being used exclusively. It's based on industrial ~~noise~~ noise, not wind turbine noise!

↳ we haven't been able to determine that this model is accurate for wind turbines.

Dore Mills:

ME needs ^{answers} info → coming up.

Louisian Sun Journal needs answers

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- Angus King will speak at the mtg as well.
- we are moving forward w/ mistakes made at Mars Hill (variance, siting).
- WHO issue → many decades of experiences in Europe → their std's are close to what ours are. (measured in dBA!)

Weber:

Lots of studies done in Denmark/Netherlands → show annoyance is an issue!

Dora Mills:

states there is no evidence for state-wide moratorium! lots of health benefits to wind turbines!

① WHO → Many yrs of experience w/ wind turbines → no evidence of adverse health effects!

Andy:

(a) Mars Hill issue - we have learned a lot from this project and will not allow variance, better changed siting, etc...

Warren:

Reviews are ready to send out!

Based on models \rightarrow in compliance w/ predictive model for 45 dBa night time ^{noise}, best. Still questions regarding the model! \rightarrow Based on industrial noise.

1990 Hudson paper done for WTSI on noise from turbines
 \hookrightarrow based on point source, but turbines are not point sources or like sources \rightarrow they are in between!

Stable atmospheric conditions:

\hookrightarrow Wind speed is stratified as change elevation \rightarrow may vary a lot \rightarrow causing air turbulence + swooshing, + popping noise. Very

\hookrightarrow Unrid turbulence noise needs more investigation!

① Need to ^{be able to} predict stable atmospheric conditions ^{is heat-field in air that does not move so fast that it can't contact them!!}

② Setup protocol for acoustic measurements
 w/ DSR staff member on-site.

\hookrightarrow may be able to get reading within month or so,
 but... not... yet at this moment.

\rightarrow Questioning RSE's assumptions, due to the model.

\rightarrow He's convinced that we can use dBa!
 and don't need to use dBc.

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Sound pressure levels may need to be tested to make sure they are in compliance w/ noise rules.

- ↳ need to collect more data (for Mars Hill)
- ↳ looked at the wrong model!

Weather shouldn't be too much of an issue this time of year.

Stability based on:

- Seasons
- Atmospheric conditions

There is a period when turbines are loud, but not sure how to predict this yet.

- ↳ Needs to figure out stable atmospheric conditions first!

3 options

Next steps:

- ① Need to calibrate model being used and determine compliance w/ Mars Hill.
 - ↳ Then need to apply it to Rollins + Record Hill. (Need to look at worst-case predictions).

- Or -

- ② Data-mining existing data from Mars Hill
 - If don't go back to Mars Hill →
 - ↳ 4 models for turbines → he's not familiar w/ them but could find someone who is.
 - ↳ would use these models for Rollins + Roxbury (Nordes model).
- Nordes model
↳ exists

Jim:

If chose option 3 \rightarrow Nordes model \rightarrow can we put it back on applicant to run the data?

\hookrightarrow Warren says that would work.

Compare outcome w/ the Nordes Model w/ existing one used.

Warren:

Nordes is a 2000⁺ model that considers wind-turbine noise, but not sure if it's a good model to use. Not sure how widely it's used.

* Will clarify next step w/ model. Will be in touch w/ Jim tomorrow afternoon!



EXHIBIT

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Maine Medical Association

Resolution RE: Wind Energy and Public Health

WHEREAS; proposals to locate and build wind energy facilities in the State have at times proven controversial, due to concerns regarding potential effects of such facilities on the public health, and

WHEREAS, the trade off between the public good of generating electricity and the adverse health effects warrant appropriate evidence-based scientific research, and

WHEREAS, assessing the potential health impact of wind turbines has been difficult to measure but if present would be of significant concern. This is especially apparent regarding the noise level and other noise characteristics specific to industrial wind turbines, and

WHEREAS, there is a need for modification of the State's regulatory process for siting wind energy developments to reduce the potential for controversy regarding siting of grid-scale wind energy development and to address health controversy with regulatory changes to include, but not limited to:

- a) Refining certain procedures of the Maine Department of Environmental Protection and the Maine Land Use Regulation Commission to reflect scientific evidence regarding potential health effects, and to further explore such potential health effects;
- b) Judging the effects of wind energy development on potential public health by avoiding unreasonable noise and shadow flicker effects, with development setbacks and incorporating upto date noise regulations specific for industrial wind turbines adequate to protect public health and safety.

THEREFORE BE IT RESOLVED that the Maine Medical Association work with health organizations and regulatory agencies to provide scientific information of known medical consequences of wind development in order to help safeguard human health and the environment.

AND BE IT FURTHER RESOLVED that the Maine Medical Association 1) work with other stakeholders to encourage performance of studies on health effects of wind turbine generation by independent qualified researchers at qualified research institutions; 2) ensure that physicians and patients alike are informed of evidence-based research results.